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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Gerald HOEFER
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For	:	METHOD AND APPARATUS FOR TRANSFORMING A SIGNAL
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(Signature)

Assistant Commissioner for Patents
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Sir:

Preliminary to examination, please amend this application as follows:

IN THE CLAIMS:

Cancel claims 24 and 39.

Add the following claim:

--42. An apparatus for transforming a signal (DS) on a four-wire line which comprises discrete amplitude height values (P1, ..., Pn) for conversion into a corresponding analog signal (AS) with amplitude height values (A1, ..., An) on a

two-wire line where said analog signal (AS) is intended for a data communication unit connectable to the two-wire line and where said data communication unit has a predefined capability for resolution of the amplitude of said analog signal (AS) and said method being determined by said amplitude height values (P1, ..., Pn) of signal DS on the four-wire line are each transformed by application of a transformation (T) where said transformation is determined in such a way that the number (n) of said amplitude height values (A1, ..., An) which said communication unit can discern in said analog signal (AS) matches a presetable criterion (K),

the apparatus comprising means for storing a mapping.--

Amend claims 4-7, 11, 12, 14-16, 22, 23, 25, 27-34 and 36-41 as follows:

4. (Amended) A method according to claim 1, wherein said transformation (T) is a multiplication of said amplitude height values (P1,..., Pn).

5. (Amended) A method according to claim 1, wherein said factor (V) is calculated by the determination of the constellation of said signal (DS).

6. (Amended) A method according to claim 1, wherein said factor (V) is calculated by the determination of the minimal difference (Dmin) of two amplitude

height values (Ai, Aj) of said analog signal (AS) that said communication unit can discern.

7. (Amended) A method according to claim 1, wherein said signal (DS) comprises amplitude height values (P1,..., Pn) according to a predefined characteristic.

11. (Amended) A method according to claim 9, wherein preceding step (f) said factor (V0) is further reduced.

12. (Amended) A method according to one of claims 1 to 4, wherein said transformation is done by replacing each amplitude height value (P1,..., Pn) according to a mapping by a predefined amplitude height value.

14. (Amended) A method according to one of claims 1 to 4, wherein said transformed amplitude height values (P1,..., Pn) exhibit a predefined accuracy.

15. (Amended) A method according to one of claims 1 to 4, wherein said signal (DS) is an analog signal.

16. (Amended) A method according to one of claims 1 to 4, wherein said communication unit is a PCM modem and said signal (DS) originates from a digital modem.

22. (Amended) A method according to one of claims 1 to 4 wherein as a first step a modem detection is performed and the subsequent steps are only taken if a modem connection has been detected.

23. (Amended) A method according to one of claims 1 to 4 implemented in a network termination unit.

25. (Amended) An apparatus according to claim 42, wherein said means for storing a mapping comprise means for storing amplitude height values that replace said amplitude height values (P1,..., Pn) accordingly.

27. (Amended) An apparatus according to claim 26, further comprising means for storage of the constellation of said signal (DS).

28. (Amended) An apparatus according to one of the claims 42, 26 and 27, wherein said means for storage of said constellation comprise at least six memory segments where each segment has enough capacity to assign one memory element

to at least those amplitude height values for which the discernable amplitude difference deviates less than 25% from the respectively previous amplitude height value.

29. (Amended) An apparatus according to claim 42 in a network termination unit.

30. (Amended) An apparatus according to claim 42, wherein the apparatus is activated at the start of a data communication between a transmission unit and said communication unit.

31. (Amended) An apparatus according to claim 30, wherein said communication unit is an analog PCM modem and said signal (DS) is generated by a digital modem.

32. (Amended) An apparatus according to claim 31, further comprising a control unit.

33. (Amended) An apparatus for detection of a modem connection from a signal (DS) comprising:

a) first means to check whether said signal (DS) comprises amplitude height values corresponding to a silence period from 70 to 80 ms;

b) second means to check whether said signal (DS) following said silence period is a predefined characteristic signal of a PCM modem; and

c) means for issuing a modem detect signal.

34. (Amended) An apparatus according to claim 33, further comprising means for storing at least 10 amplitude height values.

36. (Amended) An apparatus according to claim 33 or 34, wherein said second means is means for detecting a characteristic signal which is a periodic sequence of six amplitude height values comprising three constant positive values P and three constant negative values -P.

37. (Amended) An apparatus according to one fo the claims 33 to 36, wherein said second means is means for detecting a characteristic signal which is a periodic sequence of the amplitude height values P, 0, P, -P, 0, -P with 0 being the smallest valid amplitude height value and P being any other valid amplitude height value.

38. (Amended) An apparatus according claim 33 or 34, further comprising means for mapping amplitude height values with a deviation of up to two levels from the amplitude height values required for detection, to that amplitude height value.

40. (Amended) The combination of a codec device and an apparatus according to claim 1 or 33.

41. (Amended) The combination of a network termination unit and an apparatus according to claim 1 or 33.

Appendix A hereto shows the amendments to the claims by means of underscoring and brackets.

Appendix B shows all the pending claims as amended.

REMARKS

The present amendment makes some improvements to the claims insofar as concerns formalities.

Please charge the government fees of $135.00 for having multiple dependent claims and $80.00 for having 2 additional independent claims in excess of 3 to

Deposit Account No. 10-1250. Also charge any fee deficiency or credit any overpayment to the same deposit account.

Respectfully submitted,

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APPENDIX I

AMENDED CLAIMS WITH AMENDMENTS INDICATED THEREIN BY BRACKETS AND UNDERLINING

4. (Amended) A method according to [one of the previous claims] claim 1, wherein said transformation (T) is a multiplication of said amplitude height values (P1, ..., Pn).

5. (Amended) A method according to [one of the previous claims] claim 1, wherein said factor (V) is calculated by the determination of the constellation of said signal (DS).

6. (Amended) A method according to [one of the previous claims] claim 1, wherein said factor (V) is calculated by the determination of the minimal difference (Dmin) of two amplitude height values (Ai, Aj) of said analog signal (AS) that said communication unit [(10)] can discern.

7. (Amended) A method according to [one of the previous claims] claim 1, wherein said signal (DS) comprises amplitude height values (P1, ..., Pn) according to a predefined characteristic[, in particular a characteristic adhering to ITU recommendation G.711].

11. (Amended) A method according to claim 9 [or 10], wherein [in front of] preceding step (f) said factor (V0) is further reduced.

12. (Amended) A method according to one of [the previous] claims 1 to 4, wherein said transformation is done by replacing each amplitude height value (P1, ..., Pn) according to a mapping by a predefined amplitude height value.

14. (Amended) A method according to one of [the previous] claims 1 to 4, wherein said transformed amplitude height values (P1, ..., Pn) exhibit a predefined accuracy[, in particular at least 12 bit].

15. (Amended) A method according to one of claims 1 to [11] 4, wherein said signal (DS) is an analog signal.

16. (Amended) A method according to one of [the previous] claims 1 to 4, wherein said communication unit [(10)] is a PCM modem and said signal (DS) originates [form] from a digital modem [(50)].

22. (Amended) A method according to one of claims 1 to [16] 4 wherein as a first step a modem detection is performed[, preferably according to a method as

claimed in claims 16 to20,] and the [following] subsequent steps are only taken if a modem connection has been detected.

23. (Amended) A method according to one of [the previous] claims 1 to 4 implemented in a network termination unit.

25. (Amended) An apparatus according to claim 42, wherein said means for storing a mapping [are provided, said] comprise means [suitable] for storing amplitude height values that replace said amplitude height values (P1, ..., Pn) accordingly.

27. (Amended) An apparatus according to [the previous claim] claim 26, further comprising means [to store] for storage of the constellation of said signal (DS).

28. (Amended) An apparatus according to one of the claims [24 to] 42, 26 and 27, wherein said means for storage of said constellation comprise at least six memory segments where each segment has enough capacity to assign one memory element to at least those amplitude height values for which the discernable amplitude difference deviates less than 25% from the respectively previous amplitude height value.

29. (Amended) An apparatus according to [one of the previous claims referring to apparati, wherein an implementation] claim 42 in a network termination unit [is intended].

30. (Amended) An apparatus according to [one of the previous claims referring to apparati] claim 42, wherein the apparatus is activated at the start of a data communication between a transmission unit and said communication unit.

31. (Amended) An apparatus according to [one of the previous claims referring to apparati] claim 30, wherein said communication unit [(10)] is an analog PCM modem and said signal (DS) is generated by a digital modem[(50)].

32. (Amended) An apparatus according to [one of the previous claims referring to apparati] claim 31, further comprising a control unit [(40), in particular a microcontroller or a digital signal processor].

33. (Amended) An apparatus for detection of a modem connection from a signal (DS) comprising:

a) first means [(310, 315, 316)] to check whether said signal (DS) comprises amplitude height values corresponding to a silence period [in between] from 70 [and] to 80 ms;

b) second means [(320, 325, 326, 330)] to check whether said signal (DS) following said silence period is a predefined characteristic signal of a PCM modem; and

c) means [(340)] for issuing a modem detect signal.

34. (Amended) An apparatus according to claim 33, further comprising means [(300), in particular a ring buffer,] for storing at least 10 amplitude height values.

36. (Amended) An apparatus according to [one of the claims] claim 33 [to 35] or 34, wherein said second means [(320, 325, 326, 330) are implemented in such a way that] is means for detecting a characteristic signal which is a periodic sequence of six amplitude height values comprising three constant positive values P and three constant negative values -P [is detected as said characteristic signal].

37. (Amended) An apparatus according to one fo the claims 33 to 36, wherein said second means [are implemented in such a way that] is means for detecting a characteristic signal which is a periodic sequence of the amplitude height values P, 0, P, -P, 0, -P with 0 being the smallest valid amplitude height value and P being any other valid amplitude height value [is detected as said characteristic].

38. (Amended) An apparatus according [to one of the claims] claim 33 [to 37] or 34, [wherein for modem detection] further comprising means for mapping amplitude height values with a deviation of up to two levels from the amplitude height values required for detection [are mapped], to that amplitude height value.

40. (Amended) The combination of a [A] codec device [(21) that contains] and an apparatus according to [one of the apparatus claims] claim 1 or 33.

41. (Amended) The combination of a [A] network termination unit [(2) that contains] and an apparatus according to [one of the apparatus claims] claim 1 or 33.